

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
REQUEST FOR FILING NATIONAL PHASE OF
PCT APPLICATION UNDER 35 U.S.C. 371 AND 37 CFR 1.494 OR 1.495

To: Asst. Commissioner of Patents
Washington, D.C. 20231

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)

Atty Dkt: PM 265122 | C1517US
M# | Client Ref.

From: Pillsbury Madison & Sutro LLP, IP Group:

Date: November 28, 1999 (Sunday)
November 29, 1999

This is a **REQUEST** for **FILING** a PCT/USA National Phase Application based on:

- | | | |
|------------------------------|------------------------------|-------------------------------------------------------|
| 1. International Application | 2. International Filing Date | 3. Earliest Priority Date Claimed |
| <u>PCT/EP98/03095</u> | <u>26 May 1998</u> | <u>28 May 1997</u> |
| <u>↑ country code</u> | Day MONTH Year | Day MONTH Year
(use item 2 if no earlier priority) |
4. Measured from the earliest priority date in item 3, this PCT/USA National Phase Application Request is being filed within:
- (a) ☐ 20 months from above item 3 date (b) ☒ 30 months from above item 3 date,
- (c) Therefore, the due date (unextendable) is November 28, 1999
5. Title of Invention METHOD AND DEVICE FOR REGULATING THE COATING THICKNESS. ESPECIALLY BOND COATING THICKNESS
6. Inventor(s) BECKER et al.

Applicant herewith submits the following under 35 U.S.C. 371 to effect filing:

7. ☒ Please immediately start national examination procedures (35 U.S.C. 371 (f)).
8. ☐ A copy of the International Application as filed (35 U.S.C. 371(c)(2)) is transmitted herewith (file if in English but, if in foreign language, file only if not transmitted to PTO by the International Bureau) including:
- a. ☐ Request;
- b. ☐ Abstract;
- c. pgs. Spec. and Claims;
- d. sheet(s) Drawing which are ☐ informal ☐ formal of size ☐ A4 ☐ 11"
9. ☒ A copy of the International Application has been transmitted by the International Bureau.
10. A translation of the International Application into English (35 U.S.C. 371(c)(2))
- a. ☒ is transmitted herewith including: (1) ☐ Request; (2) ☒ Abstract;
- (3) 7 pgs. Spec. and Claims;
- (4) 3 sheet(s) Drawing which are:
- ☒ informal ☐ formal of size ☐ A4 ☐ 11"
- b. ☐ is not required, as the application was filed in English.
- c. ☐ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.
- d. ☐ Translation statement attached (not required now).

11. ☒ **PLEASE AMEND** the specification before its first line by inserting as a separate paragraph:
a. ☒ --This application is the national phase of international application PCT /EP98 /03095 filed May 26, 1998 which designated the U.S.--
b. ☐ --This application also claims the benefit of U.S. Provisional Application No. 60/ , filed
12. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., **before 18th month from first priority date above in item 3, are transmitted herewith (file only if in English) including:**
13. ☒ PCT Article 19 claim amendments (if any) have been transmitted by the International Bureau
14. ☒ Translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., of **claim amendments made before 18th month, is attached (required by 20th month from the date in item 3 if box 4(a) above is X'd, or 30th month if box 4(b) is X'd, or else amendments will be considered canceled).**
15. **A declaration of the inventor** (35 U.S.C. 371(c)(4))
a. ☐ is submitted herewith ☐ Original ☐ Facsimile/Copy
b. ☒ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.
16. **An International Search Report (ISR):**
a. Was prepared by ☒ European Patent Office ☐ Japanese Patent Office ☐ Other
b. ☒ has been transmitted by the international Bureau to PTO.
c. ☒ copy herewith (2 pg(s).) ☒ plus Annex of family members (1 pg(s).).
17. **International Preliminary Examination Report (IPER):**
a. ☒ has been transmitted (if this letter is filed after 28 months from date in item 3) in English by the International Bureau with Annexes (if any) in original language.
b. ☒ copy herewith in English.
c.1 ☐ IPER Annex(es) in original language ("Annexes" are amendments made to claims/spec/drawings during Examination) including attached amended:
c.2 ☐ Specification/claim pages # ... claims # ...
Dwg Sheets # ...
d. ☒ Translation of Annex(es) to IPER **(required by 30th month due date, or else annexed amendments will be considered canceled).**
18. **Information Disclosure Statement** including:
a. ☒ Attached Form PTO-1449 listing documents
b. ☒ Attached copies of documents listed on Form PTO-1449
c. ☒ A concise explanation of relevance of ISR references is given in the ISR.
19. ☐ **Assignment** document and Cover Sheet for recording are attached. Please mail the recorded assignment document back to the person whose signature, name and address appear at the end of this letter.
20. ☐ Copy of Power to IA agent.
21. ☐ **Drawings** (complete only if 8d or 10a(4) not completed): ... sheet(s) per set: ☐ 1 set informal; ☐ 1 set formal of size ☐ A4 ☐ 11"
22. ☐ ... (No.) **Verified Statement(s)** establishing "small entity" status under Rules 9 & 27
23. **Priority** is hereby claimed under 35 U.S.C. 119/365 based on the priority claim and the certified copy, both filed in the International Application during the international stage based on the filing in (country) GERMANY of:

	<u>Application No.</u>	<u>Filing Date</u>		<u>Application No.</u>	<u>Filing Date</u>
(1)	<u>197 22 407.5</u>	<u>29 May 1997</u>	(2)	<u>...</u>	<u>...</u>
(3)	<u>...</u>	<u>...</u>	(4)	<u>...</u>	<u>...</u>
(5)	<u>...</u>	<u>...</u>	(6)	<u>...</u>	<u>...</u>

a. ☒ See Form PCT/IB/304 sent to US/DO with copy of priority documents. If copy has not been received, please proceed promptly to obtain same from the IB.
b. ☐ Copy of Form PCT/IB/304 attached.

24. Attached: Preliminary Amendment

420 Rec'd PCT/PTO 29 NOV 1999

25. Preliminary Amendment:

25.5 Per Item 17.c2, **cancel original** pages #_____, claims #_____, Drawing Sheets #

26. **Calculation of the U.S. National Fee (35 U.S.C. 371 (c)(1)) and other fees is as follows:**
based on amended claim(s) per above item(s) ☐ 12, ☐ 14, ☐ 17, ☐ 25, ☐ 25.5 (hilitite)

					Fee Code (lg/sm entity) (see box 22)
Total Effective Claims	12	minus 20 =	0	x \$18/\$9 =	\$ 966/967
Independent Claims	1	minus 3 =	0	x \$78/\$39 =	\$ 964/965
If any proper (ignore improper) Multiple Dependent claim is present,				add\$260/\$130 +	968/969

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4)): →→ **BASIC FEE REQUIRED, NOW** →→→→→→

A. If country code letters in item 1 are **not** "US", "BR", "BB", "TT", "MX", "IL", "NZ", "IN" or "ZA"

See item 16 re:

1. Search Report was <u>not</u> prepared by EPO or JPO -----	add\$970/\$485	960/961
2. Search Report was prepared by EPO or JPO -----	add\$840/\$420 +840	970/971

SKIP B, C, D AND E UNLESS country code letters in item 1 are "US", "BR", "BB", "TT", "MX", "IL", "NZ", "IN" or "ZA"

→ <input type="checkbox"/> B. If <u>USPTO</u> did not issue <u>both</u> International Search Report (ISR) <u>and</u> (if box 4(b) above is X'd) the International Examination Report (IPER), -----	add\$970/\$485	+	960/961
(only) <input type="checkbox"/> C. If <u>USPTO</u> issued ISR but not IPER (or box 4(a) above is X'd), -----	add\$760/\$380	+	958/959
(these) <input type="checkbox"/> D. If <u>USPTO</u> issued IPER but IPER Sec. V boxes <u>not all</u> 3 YES, -----	add\$670/\$335	+	956/957
(4) <input type="checkbox"/> E. If international preliminary examination fee was paid to <u>USPTO</u> and Rules 492(a)(4) and 496(b) <u>satisfied</u> (IPER Sec. V <u>all</u> 3 boxes YES for <u>all</u> claims), -----	add \$96/\$48	+	962/963

27. **SUBTOTAL =** \$840

28. If Assignment box 19 above is X'd, add Assignment Recording fee of ----\$40 +0 581

29. Attached is a check to cover the ----- **TOTAL FEES** \$840

Our Deposit Account No. 03-3975

Our Order No. 9848 C# 265122 M#

CHARGE STATEMENT: The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 and 492 (missing or insufficient fee only) now or hereafter relative to this application and the resulting Official document under Rule 20, or credit any overpayment, to our Account/Order Nos. shown above for which purpose a duplicate copy of this sheet is attached.

This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal form is filed

Pillsbury Madison & Sutro LLP
Intellectual Property Group

1100 New York Avenue, N.W.
Ninth Floor East Tower
Washington, D.C. 20005-3918
Tel: (202) 861-3000
Atty/Sec: JMF/jrh

By: Atty: Jay M. Finkelstein

Sig: Jay M. Finkelstein

Reg. No. 21082

Fax: (202) 822-0944
Tel: (202) 861-3623

NOTE: File in duplicate with 2 postcard receipts (PAT-103) & attachments.

Inventor(s): BECKER et al. (Atty. Dkt.)
Appln. No.: / or Patent No.: 265122/C1517US
Filed: November 29, 1999 or Issued.: M# / Client Ref.
Title: METHOD AND DEVICE FOR REGULATING THE COATING THICKNESS, ESPECIALLY BOND COATING THICKNESS

SMALL ENTITY STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(d) and 1.27 (c)) - **SMALL BUSINESS CONCERN**

I hereby state that I am

- ☐ the owner of the small business concern identified below:
☐ an official of the small business concern empowered to act on behalf of the concern identified below:
NAME OF CONCERN Singulus Technologies AG
ADDRESS OF CONCERN Junkersstrasse 1, D-63755 Alzenau, GERMANY

I hereby state that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and referenced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby state that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the above entitled invention, invented by the above inventor(s) and described in:

- x →** ☐ the specification filed herewith,
one → ☒ Application No. 0 /, filed November 29, 1999
box → ☐ Patent No. , issued

If the rights held by the above identified small business concern are not exclusive, each small entity individual, concern or organization having rights to the invention is listed in (A) and (B) below and no rights to the invention are held by any person, other than the inventor, who could not qualify under 37 CFR 1.9(c) as an independent inventor if that person had made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

- (A) FULL NAME of assignee/licensee/grantee/conveyee*
ADDRESS
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION
- (B) FULL NAME of assignee/licensee/grantee/conveyee*
ADDRESS
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

*NOTE: Separate statement is required from each person, concern or organization named in (A) and (B) above having rights to the invention, averring to his/her/its status as a small entity. (37 CFR 1.27)

I acknowledge the duty to file, in this case, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

NAME OF PERSON SIGNING ROLAND LACHER
TITLE OF PERSON OTHER THAN OWNER PRESIDENT + CEO
ADDRESS OF PERSON SIGNING JUNKERSSTR. 1, 63755 ALZENAU

SIGNATURE Roland Lacher DATE 2 MAR 2000



Singulus Technologies AG - Junkersstrasse 1 - D - 63755 Alzenau

09/424660

420 Rec'd PCT/PTO 29 NOV 1999

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Stage Patent Application of PCT/EP98/03095:

BECKER et al.

Group Art Unit: Not Yet Assigned

Appln. No.: Not Yet Assigned

Examiner: Not Yet Assigned

Filed: November 29, 1999

FOR: METHOD AND DEVICE FOR REGULATING THE COATING
THICKNESS, ESPECIALLY BOND COATING THICKNESS

* * * * *

November 29, 1999

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents
and Trademarks
Washington, DC 20231

Sir:

Before beginning examination, kindly amend this application as follows:

IN THE SPECIFICATION:

Please change the PCT title to read --METHOD AND DEVICE FOR
REGULATING THE COATING THICKNESS, ESPECIALLY BOND COATING
THICKNESS--.

IN THE CLAIMS:

Please amend the replacement claims from the Annex to the International
Preliminary Examination Report as follows:

Claim 3, line 1, delete "or 2."

Claim 4, line 1, delete "claims 1 to 3" and insert --claim 1--.

Claim 5, line 1, delete "claims 1 to 4" and insert --claim 1--.

Claim 7, line 1, delete "any one of claims 1 to 6" and insert --claim 1--.

Claim 9, line 1, delete "or 8."

Claim 10, line 1, delete "any one of claims 1 to 9" and insert --claim 1--.

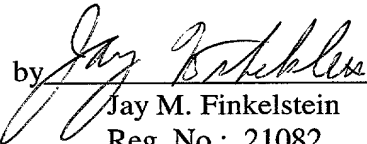
Claim 12, line 1, delete "any one of claims 1 to 9" and insert --claim 1--.

REMARKS

Upon entry of this Preliminary Amendment, there will be no multiple dependent claims in this application.

Respectfully submitted,

PILLSBURY MADISON & SUTRO

by 
Jay M. Finkelstein
Reg. No.: 21082
Telephone: (202) 861-3623
Fax No.: (202) 822-0944

JMF/jrh
1100 New York Avenue, N.W.
Ninth Floor - East Tower
Washington, DC 20231
(202) 861-3000

3/PRTS

420 Rec'd PCT/PTO 29 NOV 1999

**Method and Device for Regulating the Coating Thickness,
Especially Bond Coating Thickness**

The invention relates to a method and a device for regulating or controlling the coating or layer thickness, especially the bond coating thickness and can be used in particular in the production of DVDs (digital versatile disks, i.e. versatile writable and readable storage disks).

DE-C1-196 05 601 already describes a device for a controlled surface coating. By means of a nozzle which can be moved parallel to a substrate surface, a lacquer or varnish is applied uniformly, and by a digitally controllable step motor, the nozzle can be moved to any desired location during operation, and thus the surface to be coated can be determined. The influence of the temperature of the substrate to be coated, the temperature of the coating material and its viscosity are not taken into account during coating.

DE-A1-38 22 835 discloses a method and a device for lacquering or varnishing workpiece surfaces. During the operating cycle of a robot, a spraying gun obtains from the robot's control unit a continuously or gradually varying desired value for the lacquer flow. Moreover, the lacquer flow to the spraying gun is measured and readjusted by adjusting the flow resistance on the flow path between lacquer distributor and spraying gun in accordance with its deviation from the present desired value. Moreover, during one operating circle of the robot, the robot's control unit adjusts continuously or gradually varying values for the sprayer and/or horn air flow of the spraying gun. The method relates to the application of lacquer by means of a spraying gun and thus differs basically from the coating method of the present invention in which the coating material is applied by a dosing pump, a dosing arm being movable over the substrate and a rotary drive for rotating the substrate. In this method, especially the quality of the coating of lacquer is important. In particular, it is intended to avoid the occurrence of drops or blots during the application of lacquer. Therefore, the lacquer flow is adapted to the sprayer air. The problem of regulating the thickness of the coating material is not mentioned in the cited reference.

It was found that there is a reproducible relation between the temperature of the substrates to be coated, the temperature of the coating material and the viscosity of the coating material, on the one hand, and the expected coating thickness during bonding of substrates, on the other hand. Fig. 3 shows, for example, the dependency of the viscosity of the bonding material on the temperature. It was found that if the substrate temperature changes from 40° to 45°C, the bond coating thickness changes from 40 to 35 µm. For many fields of application, in particular in the case of DVDs, it is of great importance that the bond coating thickness meets narrow tolerances.

Therefore, it is an object of the present invention to provide a method and a device for regulating the coating thickness, wherein a reproducible high accuracy of the coating thickness is achieved.

The object is achieved with the features of the claims.

In achieving the object, the invention starts out from the basic idea of taking into account varying variables (disturbance variables) which influence the coating thickness or bond coating thickness during coating, in particular during bonding, and of controlling bonding in accordance with their influence. During coating/bonding the coating thickness is measured and deviations from a desired value are readjusted. The temperature of the substrate(s) and the temperature of the bonding material, which influence the viscosity of the bonding material, are taken into account as varying variables. The influences of the disturbance variables on the coating thickness and bond coating thickness are determined empirically, and the aggregates involved in the coating and bonding process, such as a dosing pump, a dosing arm, a rotary drive for the coating material application and bonding material application as well as a connecting means for connecting the substrates and a rotary centrifugal drive are controlled in accordance with an algorithm which takes into account the influences of the disturbance variables, in order to achieve a coating thickness which meets a given desired value.

It is an advantage of the present invention that the coating thickness can be adjusted very accurately and that there is a very low reject rate, e.g. in connection with DVDs produced in accordance with the present invention, so that the production process leads to an increased yield.

In the following, the invention is explained in more detail in connection with the drawings in which

- Figs. 1a to 1c are schematic representations of the bonding process in which the present invention can be applied,
Fig. 2 is a block diagram of the program control of the present invention, and
Fig. 3 is a diagram representing the dependency of the viscosity of the bonding material on the temperature.

Fig. 1a alone can be regarded as a representation of the bonding process in general. In this process, a coating/bonding material 7 is pumped by a dosing pump 1 out of a reservoir 6 and sprayed onto a substrate S1 via a dosing arm 2. The height of the dosing arm 2 can be adjusted with respect to the substrate 1, and said dosing arm can be moved radially over the substrate. The substrate S1 is located on a plate 9 with is kept in a motion of rotation by a rotary drive 3. The layer or coating 8 is thus formed on the substrate S1. Since the temperature during the coating process and the temperature of the material or substrate used during this process are in general not constant, the coating/bonding material and the substrate(s) have variable temperatures.

During bonding of two substrates, a connecting means places the second substrate S2 onto the coated substrate S1 (Fig. 1b).

Moreover, during bonding, excess bonding material of the coating 8 between the substrates S1 and S2 is spun off by a rotary centrifugal drive 5 (Fig. 1c).

During bonding, the processes according to Figs. 1b and 1c also influence the expected bond coating thickness, e.g. by the connecting pressure and the speed of the rotary centrifugal drive 5.

It was found that the bonding process as shown e.g. in Figs. 1a to 1c is influenced by disturbance variables such as the temperatures T1 and T2 of the respective partial substrates S1 and S2, the temperature T3 of the bonding material and the viscosity of the bonding material, so that the bond coating thickness deviates from a given desired value, which only depends on the bond material flow, its distribution on a substrate and the rotational speed of the substrate.

In accordance with the present invention, reproducible relations between the temperature, the viscosity of the coating material and the bond coating thickness are determined empirically and represented in the form of value tables and curve functions (cf. Fig. 3). The determined functional relations are made the basis of a control program for the aggregates of the coating process.

Fig. 2 shows a block diagram for controlling the bonding aggregates.

A computer PC having a memory-programmable controller (SPS) is provided. The disturbance variables such as temperatures T1 and T2 of the respective partial substrates S1 and S2 and the temperature T3 of the bonding material 7 and the kind or type B of the bonding material are inputted into said programmable controller. The PC presets the desired value. Depending on an adapted software, the outputs 1, 2, 3, 4, and 5 of the programmable controller trigger the corresponding bonding aggregates: dosing pump 1, dosing arm 2, rotary drive 3 for the bonding material coating, connecting means 4 and rotary centrifugal drive 5. For example by increasing or decreasing the bond material input, the rotational speeds and/or the rotational time and the connecting pressure, the corresponding bonding aggregates then react against or compensate a deviation of the bond coating thickness from the desired value caused by the temperature change.

A device according to the present invention for performing a method for regulating the bond coating thickness comprises preferably sensors for measuring the disturbance variables, a means for controlling the bond coating thickness during the process and a processor comprising a PC and a programmable controller for controlling bonding in accordance with the disturbance variables and the measured bond coating thicknesses. The sensor for measuring the bond coating thickness is preferably an optical sensor.

Preferably, a plurality of sensors for measuring the coating thickness are provided at different radial distances from the rotational axis of the rotary drive 3, so that the coating thickness can be measured at different points and can be supplied to the controller PC/SPS.

When the method and the device according to the present invention are used in the production of optical storage disks (DVDs), a desired value for the bond

coating thickness of e.g. 55 μm is adjusted, which has a tolerance of $\pm 10 \mu\text{m}$ in the radial direction and a tolerance of $\pm 4 \mu\text{m}$ in the tangential direction.

In addition to regulating the bond coating thickness, the method and device according to the present invention can also be used for precisely regulating the thickness of other viscous coatings on surfaces, e.g. coatings of lacquer.

Annex to the International Preliminary Examination Report

Claims

1. A method for applying thin coatings or layers of a viscous fluid onto plane substrates, in particular for forming bond layers between partial substrates (S1, S2) or coatings of lacquer on substrates thereby using a dosing pump (1) for the coating material (7), a dosing arm (2) which is movable over the substrate (S1), and a rotary drive (3) for rotating the substrate (S1) and by regulating the layer thickness to a desired value, wherein a regulator means controls the controlled variables for the dosing pump, the dosing arm and/or the rotary drive thereby taking into account the influence of varying variables (disturbance variables).
2. The method according to claim 1, characterized in that the disturbance variables which are taken into account are the temperatures (T1, T2) of the respective substrates (S1, S2) and the temperature (T3) of the coating material (7).
3. The method according to claim 1 or 2, characterized in that the influence of the disturbance variables is determined empirically.
4. The method according to claims 1 to 3, wherein a connecting means (4) for connecting the substrates (S1, S2) after the formation of bond layers and a rotary centrifugal drive (5) for spinning off excess bonding material between the substrates (S1 and S2) after connection are controlled as further controlled variables.
5. The method according to claims 1 to 4, characterized in that the coating/bonding is controlled by a PC/SPS (personal computer with programmable system) program.
6. The method according to claim 5, characterized in that the dosing pump (1), the dosing arm (2), the rotary drive (3), the connecting means (4) are operated by step motors and that the rotary centrifugal drive (5) is a servomotor.

7. The method according to any one of claims 1 to 6, characterized in that the thickness of the coating/bond coating is measured during the process in a non-contacting manner and that deviations from the desired value are readjusted automatically.
8. The method according to claim 7, characterized in that the desired value is a predetermined coating thickness range in the radial and tangential directions of the substrate.
9. The method according to claim 7 or 8, characterized in that the sensor is an optical sensor.
10. The use of the method according to any one of claims 1 to 9 in the production of optical storage disks.
11. The use according to claim 10, characterized in that at a desired value of the bond layer thickness of 55 μm , the deviation or tolerance of the bond layer thickness is $\pm 10 \mu\text{m}$ in the radial direction and $\pm 4 \mu\text{m}$ in the tangential direction.
12. A device for carrying out the method according to any one of claims 1 to 9 comprising
 - (a) sensors for measuring disturbance variables during coating/bonding of substrates,
 - (b) a means for measuring the thickness of the coating/bond coating during the process, and
 - (c) a processor for controlling coating/bonding in accordance with the disturbance variables and the measured thickness of the coating/bond coating by means of a controllable dosing pump (1), a dosing arm (2) and/or by means of a rotary drive (3, 5).

Abstract

**Method and Device for Regulating the Coating Thickness,
Especially Bond Coating Thickness**

The invention relates to a method and a device for regulating the thickness of coatings or layers, in particular of bond coatings, wherein bonding is controlled in a programmed manner thereby taking into account the influence of disturbance variables. The invention can be used especially in the production of DVDs. The advantages of the present invention are reproducible accuracy in adjusting the thickness of the coating/bond coating and thus an increased production output.

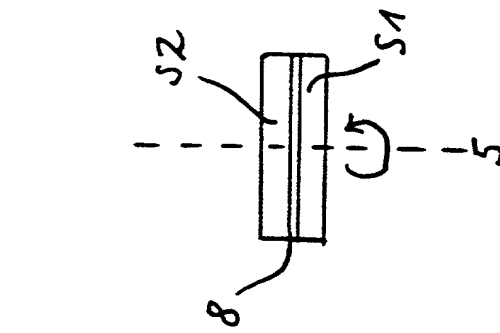


Fig. 1 c

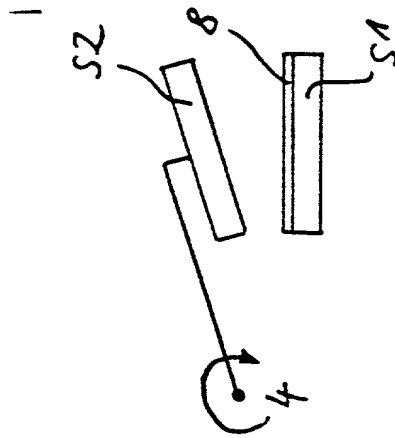


Fig. 1 b

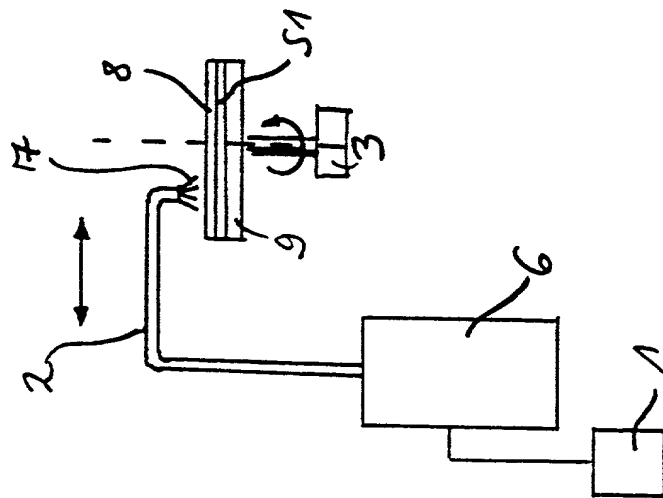


Fig. 1 a

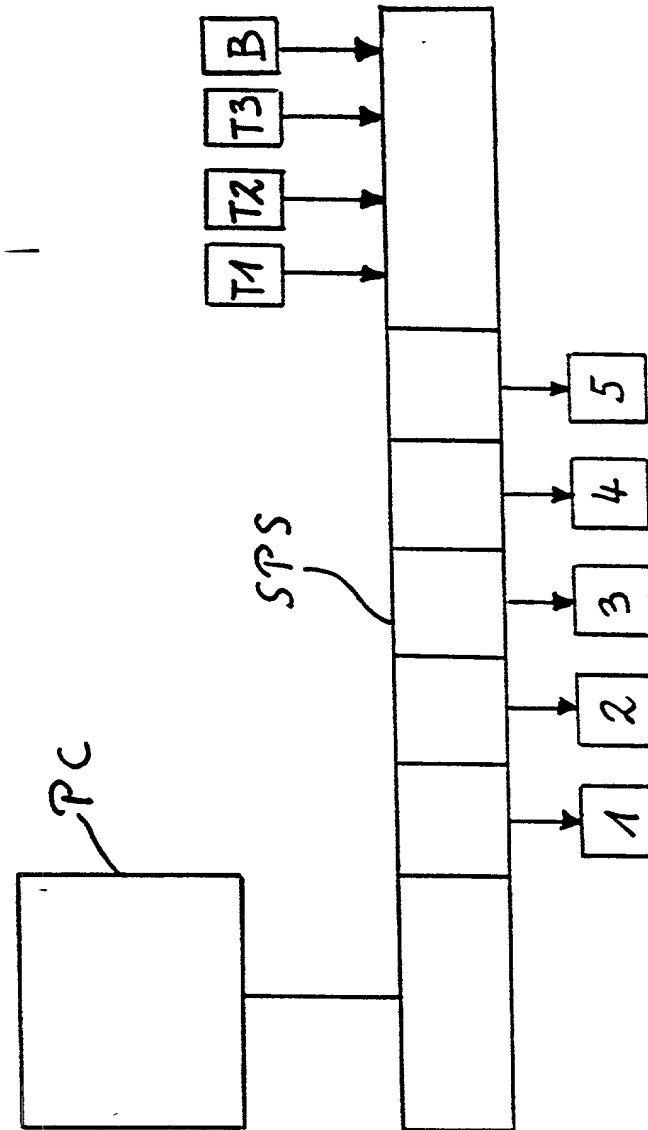


Fig. 2

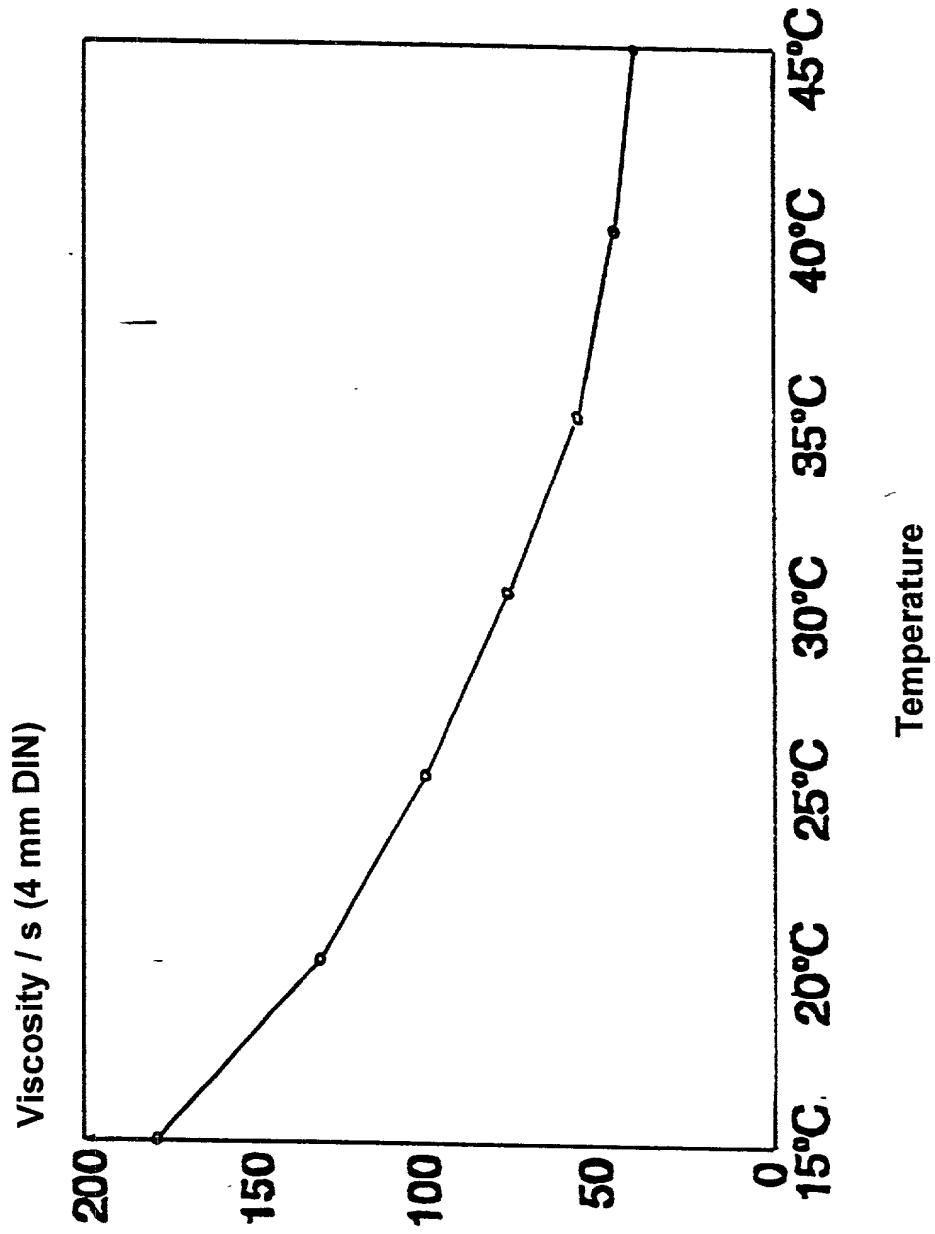


Fig. 3

**FOR UTILITY/DESIGN
CIP/PCT NATIONAL/PLANT
ORIGINAL/SUBSTITUTE/SUPPLEMENTAL
DECLARATIONS**

**RULE 63 (37 C.F.R. 1.63)
DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**PM & S
FORM**

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the **INVENTION ENTITLED METHOD AND DEVICE FOR REGULATING THE COATING THICKNESS, ESPECIALLY BOND COATING THICKNESS**

the specification of which (CHECK applicable BOX(ES))
X A. ☐ is attached hereto.
BOX(ES) → B. ☐ was filed on _____ as U.S. Application No. _____ /
→ C. ☒ was filed as PCT International Application No. PCT/ EP98/03095 on May 26, 1998

and (if applicable to U.S. or PCT application) was amended on _____
I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56. Except as noted below, I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International Application which designated at least one other country than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International Application, filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which priority is claimed, or (2) if no priority claimed, before the filing date of this application:

PRIOR FOREIGN APPLICATION(S)	Date first Laid-open or Published	Date Patented or Granted	Priority NOT Claimed
Number Country	Day/MONTH/Year Filed		
197 22 407.5 GERMANY	28 May 1997		

If more prior foreign applications, X box at bottom and continue on attached page.

Except as noted below, I hereby claim domestic priority benefit under 35 U.S.C. 119(e) or 120 and/or 365(c) of the indicated United States applications listed below and PCT international applications listed above or below and, if this is a continuation-in-part (CIP) application, insofar as the subject matter disclosed and claimed in this application is in addition to that disclosed in such prior applications, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56 which became available between the filing date of each such prior application and the national or PCT international filing date of this application:

PRIOR U.S. PROVISIONAL, NONPROVISIONAL AND/OR PCT APPLICATION(S)	Status	Priority NOT Claimed
Application No. (series code/serial no.)	pending, abandoned, patented	
Day/MONTH/Year Filed		

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

And I hereby appoint Pillsbury Madison & Sutro LLP, Intellectual Property Group, 1100 New York Avenue, N.W., Ninth Floor, East Tower, Washington, D.C. 20005-3918, telephone number (202) 861-3000 (to whom all communications are to be directed), and the below-named persons (of the same address) individually and collectively my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent, and I hereby authorize them to delete names/numbers below of persons no longer with their firm and to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct the above Firm and/or a below attorney in writing to the contrary.

Paul N. Kokulis	16773	Dale S. Lazar	28872	Mark G. Paulson	30793	Michael R. Dzwonczyk	36787
Raymond F. Lippitt	17519	Paul E. White, Jr.	32011	Stephen C. Glazier	31361	W. Patrick Bengtsson	32456
G. Lloyd Knight	17698	Glenn J. Perry	28458	Paul F. McQuade	31542	Jack S. Barufka	37087
Carl G. Love	18781	Kendrew H. Colton	30368	Ruth N. Morduch	31044	Adam R. Hess	41835
Kevin E. Joyce	20508	G. Paul Edgell	24238	Richard H. Zaitlen	27248		
George M. Sirilla	18221	Lynn E. Eccleston	35861	Roger R. Wise	31204		
Donald J. Bird	25323	Timothy J. Klima	34852	Jay M. Finkelstein	21082		
Peter W. Gowdey	25872	David A. Jakopin	32995	Anita M. Kirkpatrick	32617		

(1) INVENTOR'S SIGNATURE: Wolfgang Becker Date: Dec. 21, 1999

First	Middle Initial	Family Name
Wolfgang		BECKER
Residence	City	State/Foreign Country
Schaafheim	GERMANY	DEX
Post Office Address	City	State/Foreign Country
Sportballenstrasse 13, D-64850 Schaafheim, GERMANY	Haagsgraben 8	
(include Zip Code)		

(2) INVENTOR'S SIGNATURE: Edgar Rueth Date: Dec. 21, 1999

First	Middle Initial	Family Name
Edgar		RUETH
Residence	City	State/Foreign Country
Kaul am Main	GERMANY	DEX
Post Office Address	City	State/Foreign Country
Nassmuehlweg 2, D-63796 Kaul am Main, GERMANY		
(include Zip Code)		

FOR ADDITIONAL INVENTORS, "X" box ☒ and proceed on the attached page to list each additional inventor.
☐ See additional foreign priorities on attached page (incorporated herein by reference).

Atty. Dkt. No. PM

(M#)

DECLARATION AND POWER OF ATTORNEY

(continued)

ADDITIONAL INVENTORS:

(3) INVENTOR'S SIGNATURE:

Date:

Jan. 11, 2000

3-11	Reinhard		GERIGK
	First	Middle Initial	Family Name
Residence	Gelnhausen	GERMANY	DEX GERMANY
	City	State/Foreign Country	Country of Citizenship
Post Office Address	Uferweg 20, D-63571 Gelnhausen, GERMANY		
(include Zip Code)			

(4) INVENTOR'S SIGNATURE:

Date:

Dec. 21, 1999

4-11	Eggo		SICHMANN
	First	Middle Initial	Family Name
Residence	Gelnhausen	GERMANY	DEX GERMANY
	City	State/Foreign Country	Country of Citizenship
Post Office Address	Deutschordenstrasse 31, D-63571 Gelnhausen, GERMANY		
(include Zip Code)			

(5) INVENTOR'S SIGNATURE:

Date:

	First	Middle Initial	Family Name
Residence			
	City	State/Foreign Country	Country of Citizenship
Post Office Address			
(include Zip Code)			

(6) INVENTOR'S SIGNATURE:

Date:

	First	Middle Initial	Family Name
Residence			
	City	State/Foreign Country	Country of Citizenship
Post Office Address			
(include Zip Code)			

(7) INVENTOR'S SIGNATURE:

Date:

	First	Middle Initial	Family Name
Residence			
	City	State/Foreign Country	Country of Citizenship
Post Office Address			
(include Zip Code)			

(8) INVENTOR'S SIGNATURE:

Date:

	First	Middle Initial	Family Name
Residence			
	City	State/Foreign Country	Country of Citizenship
Post Office Address			
(include Zip Code)			

(9) INVENTOR'S SIGNATURE:

Date:

	First	Middle Initial	Family Name
Residence			
	City	State/Foreign Country	Country of Citizenship
Post Office Address			
(include Zip Code)			